

ABSTRACT OF THE DISCLOSURE

A method and apparatus for a gas delivery system to deliver a precursor from a vessel to a process chamber via a process gas produced by flowing a first carrier gas into the vessel and combining with a second carrier gas flowing through a bypass around the vessel and a precursor monitoring apparatus disposed between the process chamber and the vessel. The precursor monitoring apparatus has a gas analyzer to generate a first signal indicative of a concentration of the precursor in the process gas or to a signal indicative of a flow rate of the process gas.